

IKMT ISAACS-KIDD MIDWATER TRAWL NET

OPERATION MANUAL

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CONTENTS

GENERAL DESCRIPTION 3
STANDARD EQUIPMENT 4
TECHNICAL DATA 5
PREPARATION 6
DEPRESSOR 6
WIRE ROPES 6
NET BAG AND COVERING BAG 7
OPERATION 8
LINKING NET BAG WITH COVERING NET 9
KNOTS 10

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GENERAL DESCRIPTION

The IKMT ISAACS-KIDD MIDWATER TRAWL NET (also known as HPN Hamburg Plankton Net) ist the standard net for collection of larger quantities of macrozooplankton and micronecton, for instance necessary for the detection of trace elements or radiochemical analysis of radionuclides.

The IKMT is equipped with a net bag of MOnyl with 500 micron mesh size. The mouth opening of the net is 7 m^2, net length: 10 meters.

The drag on the fine-meshed net bag is supported by a coarse-meshed covering net and 5 webbings along the net bag.

A wide, U-shaped diving vane (called "depressor") keeps the mouth of the net open and exerts a depressing force, maintaining the trawl net at depth for extended periods at towing speeds from 0.5 to 4 knots, but the optimum towing speeds should be 2 - 3 knots because of the high level of drag exerted by the net in the water.

Due to the design of the bridle and the position of the spreader bar the mouth opening is unobstructed by the towing cable.

For the safety of the IKMT a predetermined breaking-point has been designed into the bridle which makes the net collapse when the dynamic pressure becomes too strong.

STANDARD EQUIPMENT

1. 1 Net bag of MOnyl, 500 micron mesh size
2. 1 Covering net of Nylon, 40mm mesh size
3. 1 Depressor, 3m wide, with screws (size M12), nuts and washers
4. 1 Spreader tube, 2m long
5. 1 Revolving swivel with a set of stainless steel ropes:
   - 2 x Ø 12mm, 700cm long
   - 1 x Ø 12mm, 450cm long
   - 2 x Ø 12mm, 195cm long
6. 2 Stainless steel ropes Ø 6mm, 100cm long
7. 3 Stainless steel ropes Ø 8mm, 100cm long
8. 3 Stainless steel shackles 10mm, extra wide
9. 9 Stainless steel shackles 12mm
10. 2 Stainless steel shackles 19mm
11. 2 Spanners 19mm
12. 1 Operation manual

TECHNICAL DATA

Materials:

Net bag:	MOnyl, 500 micron mesh size
Covering net:	Nylon, 40 mm mesh size
Spreader tube:	Aluminium, anodized
Depressor:	Aluminium, anodized
Revolving swivel:	stainless steel, bronze (plain bearing)
Wire ropes:	stainless steel
Shackles:	stainless steel

Dimensions:

Net bag:	width 3 m, height 3.25 m, length 10 m
Covering net:	width 3 m, height 3.25 m, length 10 m
Spreader tube:	diameter 70 mm, length 2 m
Depressor:	length 3 m, height 0.8 m, width 0.65 m

Weight:

Complete IKMT:	120 kg

Towing speed:

min:	0.5 knots (= 0.25 m/s)
max:	4 knots (= 2 m/s)
optimum:	2 – 3 knots (= 1 – 1.5 m/s)

Calculated drag:

1 knot:	0.3 tons
2 knots:	1.2 tons
3 knots:	2.5 tons
4 knots:	4.5 tons

PREPARATION

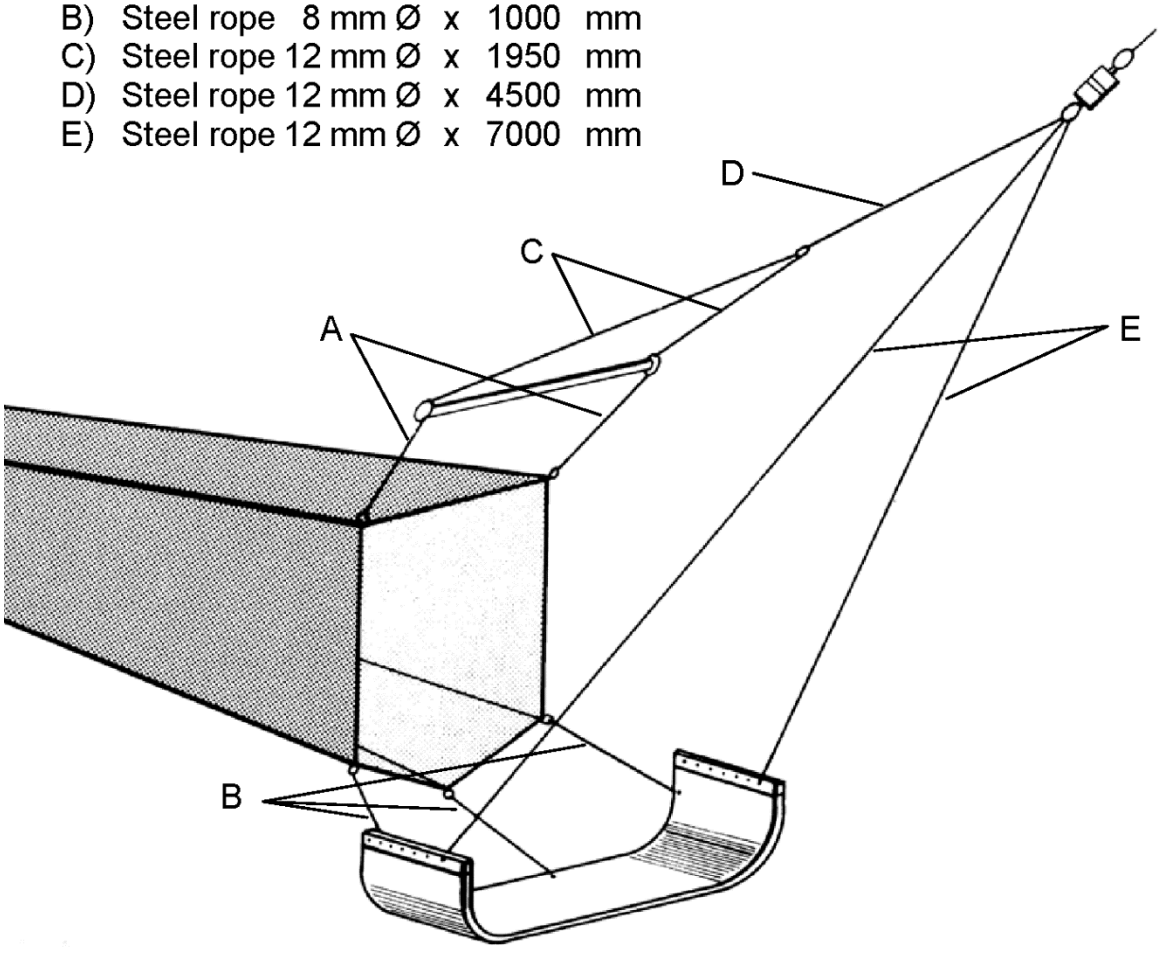
DEPRESSOR

1. Connect both halves of the depressor by using the supplied screws (size M12), nuts and washers.
2. Securely fasten screws and nuts repeatedly.

WIRE ROPES

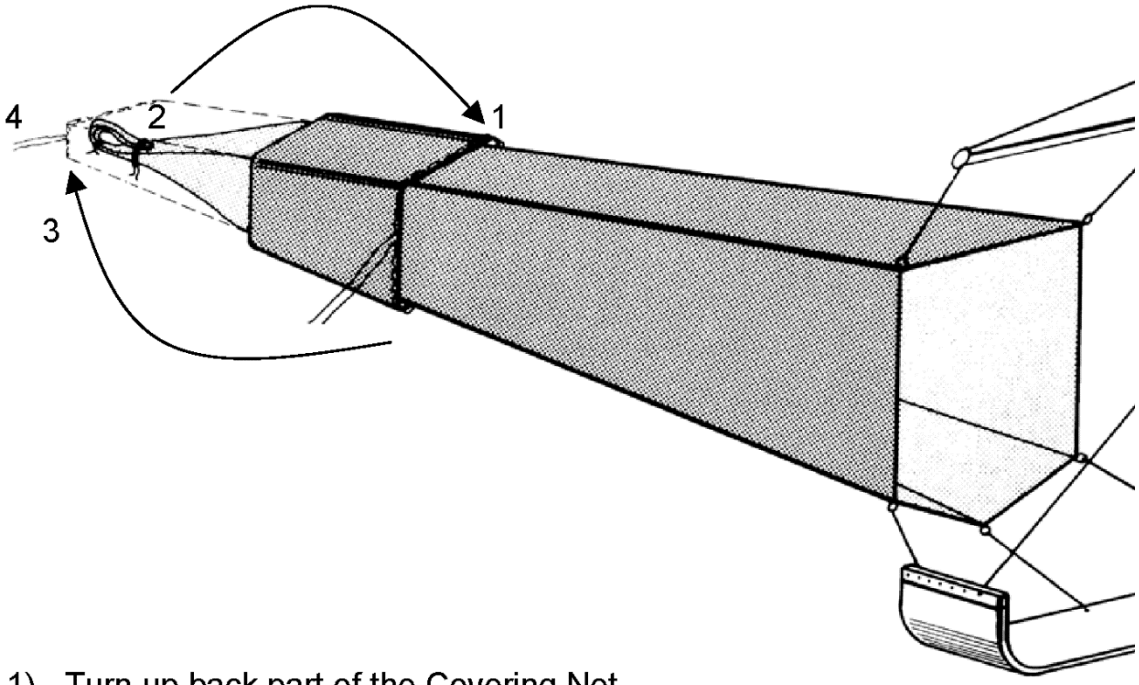
1. Connect wire ropes according to illustration below.
2. **Secure all shackle bolts** by using cable ties.

A) Steel rope 6 mm Ø x 1000 mm
B) Steel rope 8 mm Ø x 1000 mm
C) Steel rope 12 mm Ø x 1950 mm
D) Steel rope 12 mm Ø x 4500 mm
E) Steel rope 12 mm Ø x 7000 mm



NET BAG AND COVERING BAG

1. Turn back part of the covering net.
2. Pull end of net bag tight by using the closing rope attached to the net bag, fold it back and tie it up (knot type: tumble hitch)
3. Pull covering net back and push net bag into the end of the covering net.
4. Pull end of covering net tight by using the closing rope attached to the covering net, fold it back and tie it up (knot type: tumble hitch)



1) Turn up back part of the Covering Net
2) Tie up the end of Plankton Net
3) Pull the Covering Net over the Plankton Net
4) Tighten and tie up the closing rope of the Covering Net

OPERATION

1. Use a towing rope corresponding to the drag of the IKMT ISAACS-KIDD MIDWATER TRAWL NET at scheduled towing speeds.

   At 3 knots a towing cable of approx. 13 mm diameter with a breaking load above 10 tons is fine.

   At 2 knots a towing cable of approx. 11 mm diameter with a breaking load above 6 tons is fine.
2. Lift complete gear overboard while cruising with scheduled sampling speed.
3. Pay out some 10 meters of towing rope.
4. Lift gear up just below the water surface to check stable position of the gear in the water.

   Make sure that the netting is not caught on shackle bolts. If the netting is caught on shackle bolts the gear has to be heaved back on deck and the netting freed.
5. Lower the IKMT to the desired sampling depth. The towing rope should be paid out at a rate of approx. 0.4 m/s.
6. Tow IKMT for the desired time / distance.
7. Retrieve the gear at a winch speed of approx. 0.2 m/s.
8. In order to wash sticking sample to the end of the net bag, the net bag should be flushed from the outside with seawater when it has been heaved out of the water but is not yet back on deck.
9. When the gear is back on deck, open the tied cod end of the covering net.
10. Place end of net bag inside a container and open tied end of net bag. Pull net bag upwards to empty the net bag into the container.
11. Rinse complete gear (with special care for the net bag) with fresh water.
12. Before storage let dry complete gear with special care for net bag and covering net.

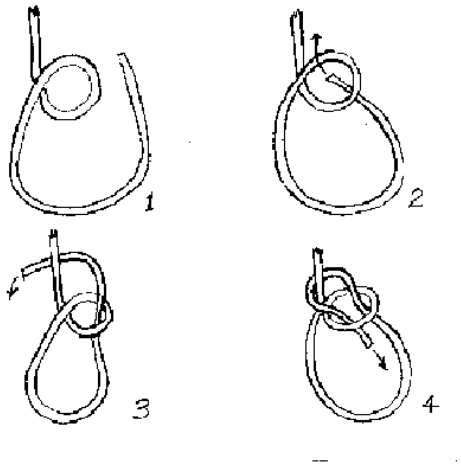
LINKING NET BAG WITH COVERING NET

1. Unfurl and lay down net bag (with 2 m side up).
2. Unfurl and lay down covering net (with 2 m side up) BEHIND the net bag.
3. Fix a long rope (min. 10 m long) at the end of the net bag.
4. Guide long rope through covering net and draw net bag into the covering net.
5. Orientate net bag towards covering net (2 m sides up) until each thimble of covering net coincides exactly midway between the corresponding close pair of eyelets of the net bag.
6. The link between net bag and covering net is made by 5 nylon ropes of 8 mm diameter.
7. Knot a 5 m rope to the upper left corner of net bag and covering net (knot type: bowline knot).
8. Tie upper side of net bag and covering net together (knot type: half hitch). To make sure that the drag at the net bag is worn by the covering net, each side of the covering net is about 5 cm shorter than the corresponding side of the net bag. Thus the collar of the net bag should buckle about 0.5 cm between two eyelets. Use bowline knot at the end of the upper side.
9. Proceeding clockwise, repeat this procedure for the remaining sides of the pentagon. Use 6.5 m ropes for the vertical sides and 4.2 m ropes for the lower sides.

KNOTS

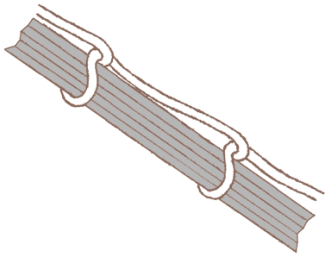
BOWLINE KNOT

Used at both ends of the linking rope of net bag and covering net.



HALF HITCH

Used as intermediate knot for linking net bag and covering net.



TUMBLE HITCH

Used as slip knot during tying up the end of net bag and covering net.

